

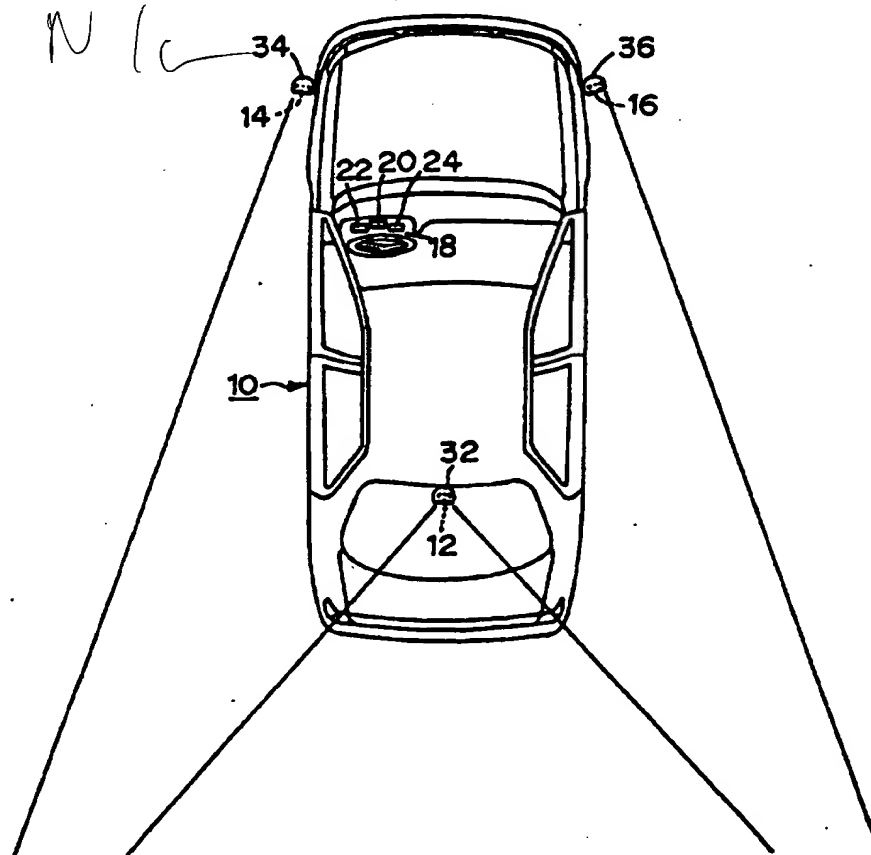


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>B60R 1/00</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 96/21581</b> <b>(43) International Publication Date:</b> 18 July 1996 (18.07.96)
<b>(21) International Application Number:</b> PCT/KR95/00010 <b>(22) International Filing Date:</b> 13 February 1995 (13.02.95) <b>(30) Priority Data:</b> 1995/516 13 January 1995 (13.01.95) KR <b>(71) Applicant (for all designated States except US):</b> NINE LIGHTS & COMPANY [KR/KR]; 25-6, Chongam-1dong, Sungbuk-ku, Seoul 136-091 (KR). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> BANG, Young, Soo [KR/KR]; 8-101, Hyundai Mansion, 605-4, Sinsa-dong, Kangnam-ku, Seoul 135-120 (KR). <b>(74) Agent:</b> BAEK, Young, Bang; #1202, Dacheung Building, 648-23, Youksam-dong, Kangnam-ku, Seoul 135-080 (KR).		<b>(81) Designated States:</b> AU, BG, BR, CA, CN, CZ, HU, JP, PL, RU, US, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). <b>Published</b> With international search report.

**(54) Title:** BACKWARD AND SIDE-BACKWARD WATCHING SYSTEM FOR AUTOMOBILE**(57) Abstract**

This invention is a backward and side-backward watching system of automobile which is made such that, in order that a driver can exactly watch the backward and side-backward at the same time with looking at front-ward without turning one's head in wide width, small TV cameras (12, 14, 16) equipped at back and both sides of automobile (10) and image monitors (20, 22, 24) attached to an instrument board (18) of automobile (10) are connected each other, so that the image signals of backward and side-backward of automobile outputted from the small TV cameras (12, 14, 16) can be displayed to a driver through the image monitors (20, 22, 24).



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BACKWARD AND SIDE-BACKWARD WATCHING SYSTEM  
FOR AUTOMOBILE

TECHNICAL FIELD

5

The present invention relates to a novel backward and side-backward watching system for automobile.

BACKGROUND ART

10

Heretofore, a driver has distinguished objects existing at backward and side-backward through a inside mirror and both of outside mirrors.

In other word, heretofore since backward  
15 direction and side-backward direction were observed through a reflection image by a inside mirror and outside mirrors, in case of outside mirrors, invisible parts, i.e., dead angle zones were much, and in night time, objects could not be distinguished because of  
20 glaring due to head light of automobile running at rear, in case of running on raining road, the reflection images by the inside mirror and outside mirrors were not exactly visible due to rain drops stained to back window and side windows during running  
25 the raining road because the inside mirror and outside

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mirrors are visible through the back window and side windows of the automobile, in order that a driver who has looked at front watches backward and side-backward during running, since he or she should turn one's eyes  
5 toward the inside mirror and the outside mirrors, considerable feeling of burden was given to the driver, and particularly there has been a problem that excessive feeling of burden was given to a beginning driver or a driver during running on a road which is  
10 not well acquainted so that a feeling of fatigue was easily felt or an accident against safety was induced.

And, a freight car such as big truck or bus and the like is difficult to secure a backward field of vision so that it is almost impossible to watch for a small  
15 vehicle approached to back or obstacle, and therefore there has been a problem that worry to induce a rear-end collision accident during running was much.

#### DISCLOSURE OF INVENTION

20

Inventor of this application has become to know that a driver can exactly watch front-ward, backward, and side-backward at same time without turning one's head in wide width if a situation of backward and  
25 side-backward directions is made to be able to see at

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an instrument board of automobile, so it has come to complete this invention.

It is an object of the present invention to provide a backward and side-backward watching system of automobile which is made to display an image signal  
5 outputted from small TV cameras equipped at both side of front and rear of automobile through an image monitors attached to an instrument board of automobile.

10

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 is a plane view of an automobile showing an example equipped with a watching system in accordance  
15 with the present invention,

FIG.2 is a wiring diagram of the watching system shown in FIG.1, and

FIG.3 is a wiring diagram showing an example of another embodiment of the watching system shown in  
20 FIG.2.

#### BEST MODE FOR CARRYING OUT THE INVENTION

Hereinafter, a preferred embodiment of the  
25 present invention will be described more in detail

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with reference to the accompanying drawings.

The present invention, as shown in FIG.1 and 2, is an article that small TV cameras 12,14,16 equipped at back and both sides of front of automobile 10 and  
5 image monitors 20,22,24 attached to an instrument board 18 of automobile 10 are connected by cord wires 26,28,30, so as to be able to display the backward and side-backward image signals of automobile outputted from the small TV cameras 12,14,16 through the image  
10 monitors 20,22,24 to a driver.

The small TV cameras 12,14,16 are fixed to the automobile 10, and they are protected and supported within housings 32,34,36 of one end opened container form so as not to be smeared by rain drops, muddy  
15 water and dust.

The image monitors 20,22,24 are made by a small cathode ray tube (CRT) or small liquid crystal display (LCD).

In the present invention, the small TV cameras  
20 12,14,16 are desirable to use an ordinary incident light reduction filter in order to prevent a glazing by head light of automobile running at rear at night time, and the small TV cameras 12,14,16 are also desirable to use a variable focus TV camera capable of  
25 watching by selecting the objects existing at remote

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or near distance, and the image monitors 20,22,24 or wide angle image monitor 40 can be made to obtain a picture in which traffic accident spot looks are contained and recorded by connecting a usual recording  
5 means 42.

In the present invention, the image monitors 20,22,24 or the wide angle image monitor 40 may be equipped not only to the instrument board 18 but to a place equipped with conventional inside mirror.

10 Explaining an operation and effect of the present invention constructed as these, it will be as follows.

In accordance with the present invention, since a driver can watch the image of backward and side-backward of automobile taken by the small TV cameras  
15 12,14,16 equipped at backward and side-backward of the automobile 10 through the image monitors 20,22,24 or the wide angle monitor 40 attached around the instrument board 18 residing at front of driver' seat, the driver can easily catch the situation of backward  
20 and side-backward of automobile with looking at the front-ward during running.

Accordingly, since the driver is good if he or she does not turn one's eyes and look at the inside mirror and both outside mirrors during running in  
25 order to watch backward and side-backward, the feeling

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of burden is not given to the driver whereby the feeling of fatigue according to the driving is reduced, and it gives much help for safety driving.

5     INDUSTRIAL APPLICABILITY

Since the present invention watches the image taken by the small TV cameras 12,14,16 equipped at exterior of the automobile 10 through the image  
10 monitors 20,22,24 or the wide angle image monitor 40 within inside of room of automobile 10 without watching the situation of backward and side-backward directions through a back window and side windows of automobile, an obstacle of visual field due to a rain  
15 drops stained to car windows during running on rainy road is not present, therefore it provides the backward and side-backward watching visual field necessary for the safety driving to a driver without almost receiving any influence of weather change, and  
20 it has advantage that the picture contained and recorded with traffic accident spot looks can be obtained by utilizing the recording means 42 connected with the image monitors 20,22,24 or the wide angle image monitor 40.



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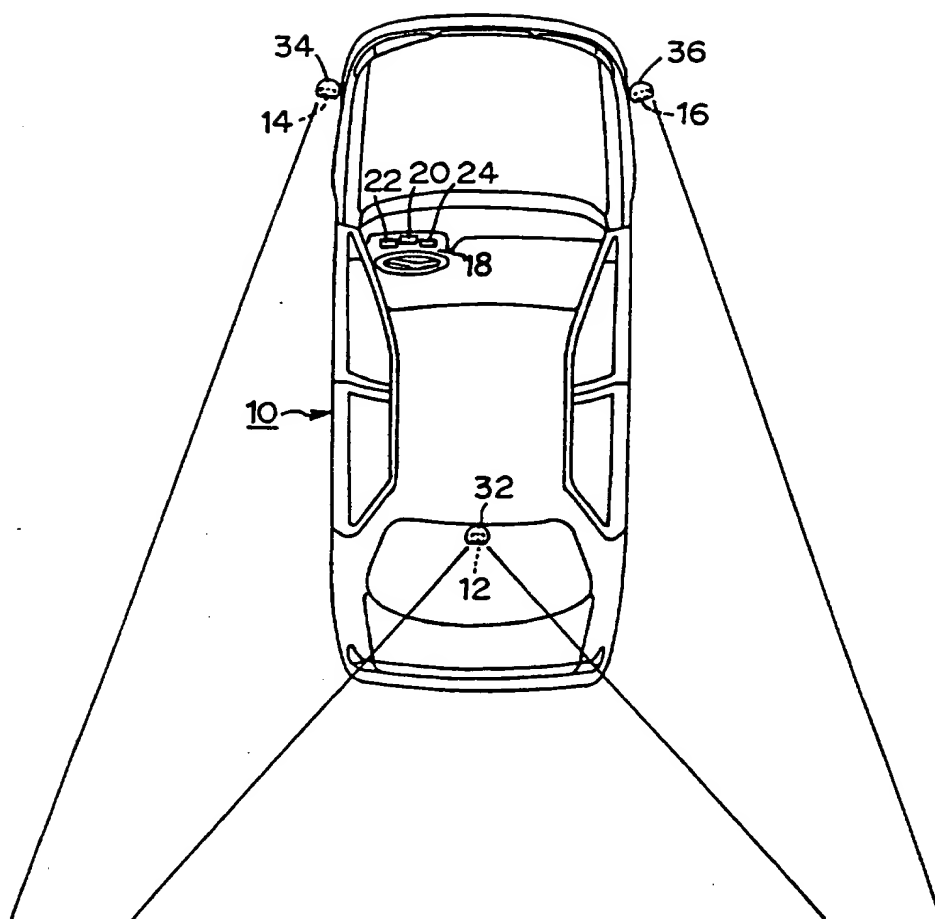
CLAIMS :

1. Backward and side-backward watching system of  
5 automobile which is made such that small TV cameras  
12,14,16 equipped at backward and side-backward of  
automobile 10 and image monitors 20,22,24 attached to  
an instrument board 18 of the automobile 10 are  
connected each other, so that image signals of  
10 backward and side-backward of automobile outputted  
from the small TV cameras 12,14,16 can be displayed to  
a driver through the image monitors 20,22,24.

2. Backward and side-backward watching system of  
automobile as defined in claim 1, which is made by  
15 connecting the small TV cameras 12,14,16 to an  
ordinary panoramic image synthesizer 38 and a wide  
angle image monitor 40.

3. Backward and side-backward watching system of  
automobile as defined in claim 1 or 2, which comprises  
20 a recording means 42.

FIG.1



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FIG.2

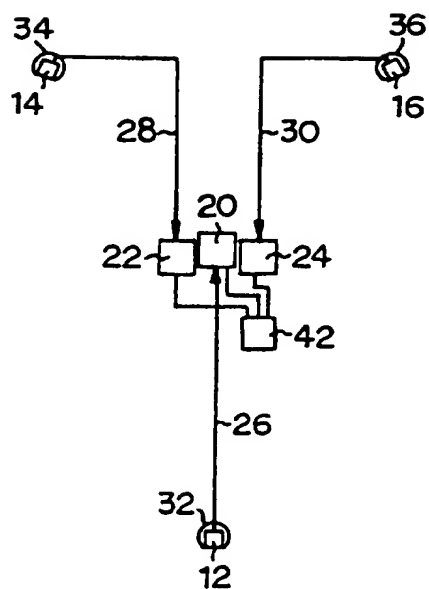
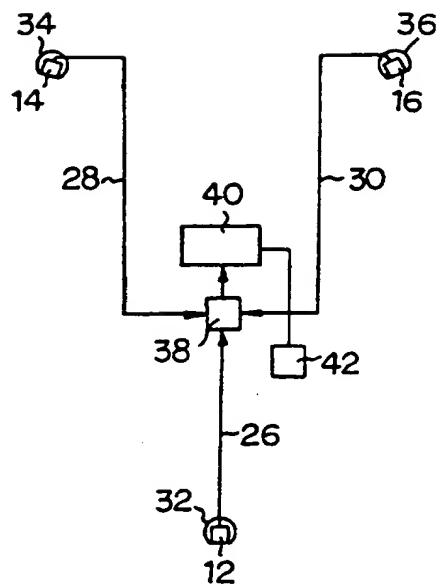


FIG.3



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR 95/00010

## A. CLASSIFICATION OF SUBJECT MATTER

IPC<sup>6</sup>: B 60 R 1/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>6</sup>: B 60 R 1/00, 11/00, 11/04; H 04 N 7/18

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 90/01 853 A1 (PETROSSIAN) 22 February 1990	1
A	(22.02.90), fig. 1-5; abstract.	2
X	FR 2 465 612 A1 (SANTENERO) 27 March 1981 (27.03.81),	1
A	fig. 1-3.	2
A	FR 1 377 315 A (LANGER) 28 September 1964 (28.09.64),	1,2
	fig. 1.	
A	US 4 214 266 A (MYERS) 22 July 1980 (22.07.80), fig.1.	1
X	DE 30 15 737 A1 (EUMIG) 13 November 1980 (13.11.80),	3
	claim 1; fig. 5,6.	
X	AT 398 295 B (KAINZ) 15 March 1994 (15.03.94), totality.	3
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☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents:

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Date of the actual completion of the international search  
28 August 1995 (28.08.95)Date of mailing of the international search report  
04 September 1995 (04.09.95)Name and mailing address of the ISA/AT  
AUSTRIAN PATENT OFFICE  
Kohlmarkt 8-10  
A-1014 Vienna  
Facsimile No. 1/53424/535Authorized officer  
Pangratz e.h.

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.

PCT/KR 95/00010

In Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
WO A1 9001853	22-02-90	AU A1 41883/89 US A 4910591	05-03-90 20-03-90
FR A1 2465612	27-03-81	keine - none - rien	
FR A 1377315		keine - none - rien	
US A 4214266	22-07-80	keine - none - rien	
DE A1 3015737	13-11-80	keine - none - rien	
AT B 398293	25-11-94	AT A 1810/92 EP A1 550397 JP A2 5343547 AT A 2/92 AT B 398294	15-03-94 07-07-93 27-12-93 15-03-94 25-11-94